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Title of the Device : Air cleaner

Application : S59-44395 Mar.28,1984.

Creator of Device ; Yoshio Ishii, Shigeru Okaya, Akira Takagi,

Applicant ; Tsuchiya Seisakusho Ltd.

Specification

1. Title of the Device ; Air cleaner

2. Claim of Utility Model

The air cleaner has the honeycomb body with the filter media which is formed into many parallel flutes that are alternately sealed at the inlet ports and the outlet ports, and the outside wall of the honeycomb body is thick.

The inlet port of the air cleaner is connected to the inlet port of the honeycomb body, and the outlet port of the air cleaner is connected to the outlet port of the honeycomb body.

3. Detailed Explanation of the Device

This device is used for internal combustion engines and powder technology.

In those fields, the clean air is used after the dust in the air is caught by the filter element. For the increase of the filtrating area with the intention of giving a long life and cost down, the honeycomb body shown in Fig.1 is used instead of the traditional filter with the pleat-type element and the bag filter.

The air cleaner equipment 50 consists of the air inlet pipe 51, the air outlet pipe 52 and the cylindrical retainer 53 with the honeycomb body 54 placed between 51 and 52. The honeycomb body 54 has the filter media which is formed into many parallel flutes that are alternately sealed at the inlet ports and the outlet ports.

By the way, it is easy to keep the circularity of the inner diameter of the cylindrical retainer 53 made from steel, but it is not so easy to keep the circularity of the outer diameter of the honeycomb body 54 because of its material's property.

When we want to fill up sealing compound to the clearance

between the honeycomb body 54 and the cylindrical retainer 53 to prevent leakage, it is difficult to fill up sealing compound completely because of small clearance. And, the air inlet pipe 51 and the air outlet pipe 52 must be rigid to support the weight of the cylindrical retainer 53.

This device is related to the air cleaner which has no difficulties mentioned above.

The outside wall of the honeycomb body is thickened by the filter media itself or resin coating, etc., and the end packings are fixed on the both ends of the honeycomb body.

The air cleaner has such honeycomb body of which the end packings are connected with the air inlet pipe and the air outlet pipe.

So, the accuracy of the outer diameter of the honeycomb body is not required to prevent leakage.

This device provides us good sealing, the weight saving honeycomb body and the burnable one.

The explanation by one of the working examples is as follows.

The air cleaner equipment shown in Fig. 2 consists of the air inlet pipe 1, the air outlet pipe 2 and the honeycomb body 3.

The air inlet pipe 1 is cylindrical and has the circular flange 11 at the end of the pipe. The air outlet pipe 2 is also cylindrical and has the flange 21 of which the dimension is the same as the flange 11.

For example, the honeycomb body is the spiral-type element shown in Fig. 3. The wave plate media 32 consists of the hills 33 and the dales 34. The one side of the hills 33 and the other side of the dales 34 are closed. The wave plate media 32 is piled on the flat plate media 31. Such combined media is coiled spirally around the center core, and the inlet port 37 and the outlet port 38 are formed.

When the coiling of the combined media is over, the thick outside wall 36 is built up by coiling the flat plate media 31 from the end of the combined media repeatedly with adhesive agent. And the packings 39 of which the cross section is trapezoid are pasted around the outside wall 36. The rings 4 are used for clamping

the packings 39 of the honeycomb body 3 and the flanges 11,21 to support the flanges 11, 21 and the outside wall 36 ,and to maintain sealing performance.

The outside wall 36 of the honeycomb body 3 may be coated by heat-hardening resin or reinforced by fiber or metal lath to keep the strength of itself.

The function of the air cleaner mentioned above is as follows.

The air with dust comes in from the air inlet pipe 1 ,enters to the inlet port 37 of the honeycomb body 3 ,is purified through the filter media and goes out from the outlet port 38 to the air outlet pipe 2 . Even if the outer diameter of the honeycomb body 3 is offset to the inner diameter of the inlet pipe 1 or becomes oval, the packings 39 around the honeycomb body 3 can seal the joint between the honeycomb body 3 and the flanges 11,21 of pipes.

And the thick outside wall 36 of the honeycomb body 3 protects the shape of the inside through paths, and reduces the load on the air inlet pipe 1 and the air outlet pipe 2 .

As known by the detailed explanation of the device mentioned above, the air cleaner has the honeycomb body for the increase of the filtrating area, and the honeycomb body has the thick outside wall and the packings around the ends of itself. So, it is not required to produce the outer diameter of the honeycomb body precisely, and the retainer pipe can be eliminated for weight saving.

4. Brief Description of Drawing

Fig.1 : the traditional air cleaner

Fig.2 : the air cleaner related to this device

Fig.3 : one of the working examples of the honeycomb body

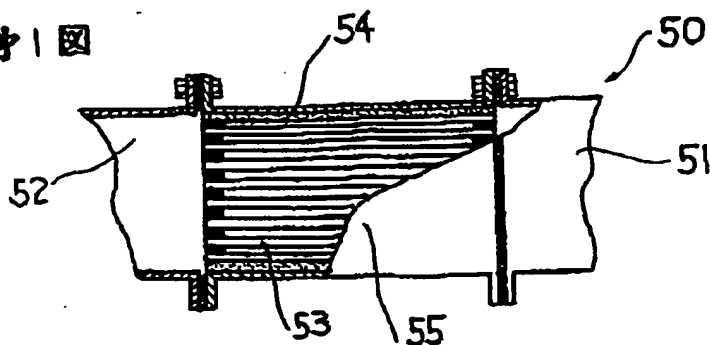
3 : honeycomb body

36 : outside wall

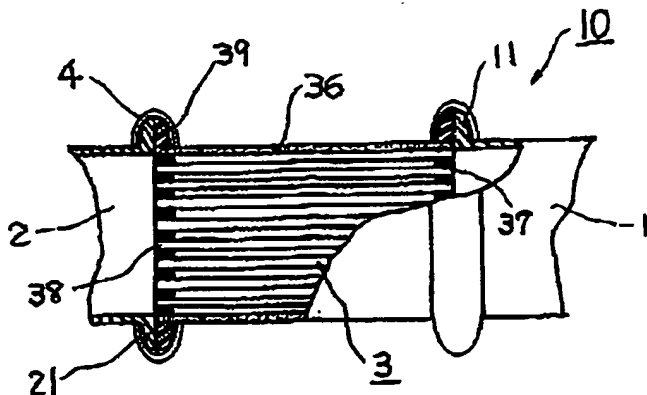
39 : packing

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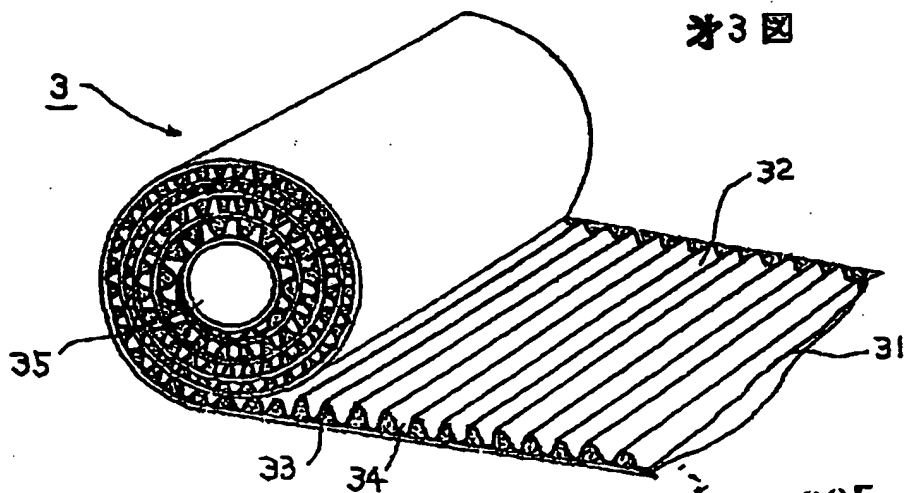
第1図



第2図



第3図



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